

REMARKS

Claims 1-32 and 34-40 were presented for examination in the present application and remain pending for consideration upon entry of the instant amendment. Claim 25 has been amended into independent form, namely to include elements of base claim 23.

The specification has been amended to obviate the objections thereto. Specifically, the title has been amended in the manner suggested by the Examiner and the paragraph referring to the claims has been deleted. Reconsideration and withdrawal to the objections are respectfully requested.

The objection to the order of dependent claims 18-21 and 34-39 is acknowledged. As noted by the Manual of Patent Examining Practice, the order of claims may change during prosecution, and be in conflict with the requirement that dependent claims refer to a preceding claim. Applicants respectfully request withdrawal of this objection and renumbering of the claims upon allowance.

Claims 5, 14, 18, 24, 39, and 40 have been amended to obviate the objections to the claims. It is submitted that these amendments merely make explicit what had been implicit in the claims. Reconsideration and withdrawal to the objections to claims 5, 14, 18, 24, 39, and 40 are respectfully requested.

Claim 1 has been amended to remove all reference numbers.

Independent claim 1 and dependent claims 2-7, 9-14, 16-21, and 36-40 were rejected under 35 U.S.C. §103 over U.S. Publication No. 2002/0019069 to Wada et al. (Wada) in view of U.S. Patent No. 4,374,391 to Camlibel et al. (Camlibel). Dependent claims 8, 15, 22, and 34-35 were rejected under 35 U.S.C. §103 over Wada and Camlibel in view of one or more of U.S. Patent Nos. 4,889,960 to Butt (Butt), 6,111,270 to Xu et al. (Xu), and 2005/0244949 to Miles (Miles).

Independent claim 1 requires, in part, the step of "thinning the substrate on the underside (emphasis added)".

The Office Action asserts that the thinning step is interpreted as "making to the desired thinness", which is inherent in the teaching of Wada.

Applicants respectfully disagree.

Wada simply does not disclose or suggest the step of thinning the substrate as claimed.

Wada discloses that semiconductor wafer 5 may be provided with the optical glass 9. The optical glass 9 has dicing lines Lb formed in the same pattern as the dicing lines La of the semiconductor wafer 5. The glass 9 is bonded to a surface of the semiconductor wafer 5 using an adhesive 11 after the dicing lines La and Lb have been aligned with each other. Thereafter, the semiconductor wafer 5 and optical glass 9 are diced together along the dicing lines La and Lb. See paragraph [0113].

Thus, Wada merely discloses aligning the dicing lines of the glass 9 and wafer 5, bonding these two components together, then dicing them along the aligned dicing lines. However, Wada simply does not disclose or suggest thinning the wafer.

Moreover, even if one was to consider the wafer 5 of Wada to have been made to the desired thinness as asserted (which it is not), Wada simply does not disclose or suggest that this desired thinness was provided by thinning on the underside as claimed.

Further, independent claim 1 requires the step of "vapor-coating the first substrate side with a glass layer" before the step of "thinning the substrate on the underside".

If one was to consider that the wafer 5 of Wada was made to the desired thinness as asserted, this desired thinness would have been provided before bonding of the optical glass 9 to the wafer. As such, the making of the wafer 5 to the desired thinness, even if it were to be considered a thinning step (which it can not) would occur before the bonding of the glass to the wafer and, not, after vapor coating as claimed.

Accordingly, it is respectfully submitted that Wada fails to disclose or suggest the thinning step of claim 1.

The Office Action fails to assert that any of the remaining cited references (e.g., Camlibel, Butt, Xu, and Miles) alone or in combination with one another disclose or suggest the "thinning" recited by claim 1.

Again, independent claim 1 recites the step of "vapor-coating the first substrate side with a glass layer".

The Office Action acknowledges that Wada fails to disclose vapor coating. Rather, the Office Action asserts that one skilled in the art would be motivated to use the e-beam deposition of Camlibel to modify the process of Wada "*to prevent the contamination from the adhesive*".

Applicants respectfully traverse this assertion.

The prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Applicants respectfully submit that the cited art simply does not contain some suggestion or incentive that would have motivated the skilled artisan to “prevent contamination from the adhesive” as asserted by the Office Action.

Wada requires an adhesive to bond the glass to the wafer. Clearly, Wada does not consider that the adhesive provides any contamination. Camlibel uses no adhesive and, thus, also does not suggest adhesives as being a source of contamination.

Rather, Applicants submit that the Office Action has used an improper standard in arriving at the rejection of the above claims under Section 103, based on improper hindsight which fails to consider the totality of Applicants’ invention and to the totality of the cited references.

In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both the invention and the prior art “as a whole”, not from improper hindsight gained from consideration of the claimed invention. See Interconnect Planning Corp. v. Feil, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985).

The present application discloses that the prior use of adhesives can cause damage (e.g., contaminate). Specifically, the present application discloses that:

To encapsulate integrated circuits and optoelectronic components, it is known to use an organic adhesive layer to bond a thin plate of glass onto the module and thereby to cover and protect the sensitive semiconductor structures. This design has the drawback that over the course of time water can diffuse into the organic adhesive layer and can then reach and damage the semiconductor structures. Furthermore, the adhesive layers may age as a result of UV irradiation, which is damaging in particular to electro-optical modules. See page 1, lines 11-30.

Applicants respectfully submit that the motivation used for modifying the disclosure of Wada has been gained from improper hindsight from the disclosure of the present application. Accordingly, Applicants submit that there is simply no motivation to modify the disclosure of Wada in the manner proposed by the Office Action.

In light of each of the reasons set forth above, claim 1 is believed to be in condition for allowance. Claims 2-22 and 34-40 are also believed to be in condition for allowance for at least the reason that they depend from claim 1. Reconsideration and withdrawal of the rejections to claims 1-22 and 34-40 are therefore respectfully requested.

Independent claim 23 and dependent claims 25-27, 31, and 32 were rejected under 35 U.S.C. §102 over Wada. Dependent claims 24 and 28-30 were rejected under 35 U.S.C. §103 over Wada in view of one or more of Camlibel, Butt, and Xu.

Independent claim 23 has been clarified to recite that the glass layer is "vapor-deposited on the first substrate side".

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Gamero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)

The Office Action acknowledges that Wada fails to disclose vapor deposited glass. See page 7, item 24 of the Office Action dated March 20, 2006.

Accordingly, Applicants respectfully submit that the glass layer that is "vapor-deposited on the first substrate side" imparts distinctive structural characteristics to the final product not disclosed or suggested by Wada.

As discussed in detail above with respect to the proposed combination of Wada

and Camlibel, Applicants respectfully submit that there is simply no motivation, other than that gained from improper hindsight, for modifying the disclosure of Wada in view of Camlibel.

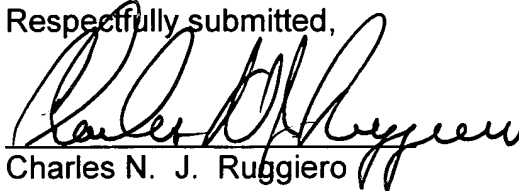
Therefore, independent claim 23, as well as claims 24 and 26-30 that depend therefrom, are not disclosed or suggested by Wada, alone or in combination with Camlibel, Butt, and Xu. Claims 23-24 and 26-30 are therefore in condition for allowance. Reconsideration and withdrawal of these rejections are respectfully requested.

Independent claim 25 has been amended to clarify that the plastic layer is "on a surface of the glass layer opposite the substrate". Wada discloses using adhesive 11 to adhere optical glass 9 to semiconductor chip 6. Clearly, the adhesive 11 of Wada, which is between the glass 9 and the semiconductor 6 is not on a surface of the glass layer opposite the substrate as recited by clarified claim 25. Reconsideration and withdrawal of the rejections to claim 25 are therefore respectfully requested.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited. If for any reason the Examiner feels that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

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Respectfully submitted,



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